Stoney Hill Rd
Traffic & Road Changes
Neighborhood feedback
part 2

1/25/16

Agenda

- Tetra Tech traffic study review
  - Existing traffic data shows very difficult Peak hour challenges
  - Traffic data volumes may actually support a traffic signal
  - Vehicle Delay & Queuing study doesn’t have correct focus
- Stoney Hill winter & alternate route concerns

Existing Traffic Volumes - *Stoney Hill West End AM Peak*

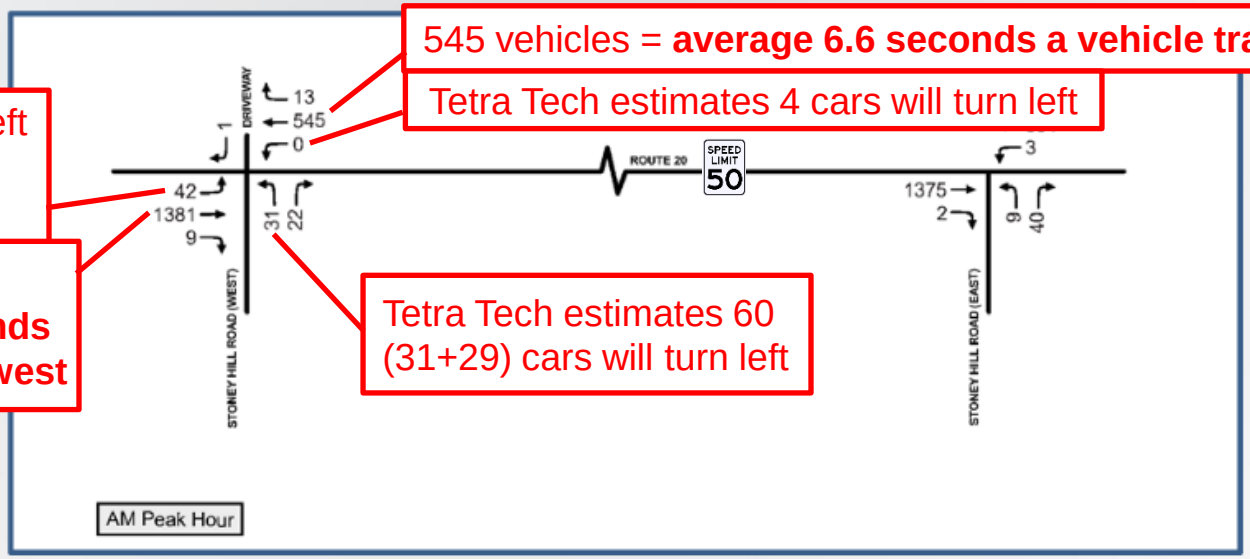
545 vehicles = **average 6.6 seconds a vehicle travels east**

Tetra Tech estimates 4 cars will turn left

42 trucks turning left into TriState = ~**1 truck a minute**

1381 vehicles = **average 2.6 seconds a vehicle travels west**

Tetra Tech estimates 60 (31+29) cars will turn left



- **Existing traffic volumes are very challenging for AM Peak hour left turns**
- **Stoney Hill West End left turns are avoided during peak hours. Lowering the estimated use**
- **Average is one car every 2.6 seconds traveling east & 6.6 seconds west. While about one truck a minute waits to turn left into TriState trucking**
- **Tetra Tech estimates 60 cars or 1 a minute will try to turn left exiting SH into a single 50mph westbound lane and avoiding all other traffic.**
- **This intersection will be unsafe during AM Peak times**

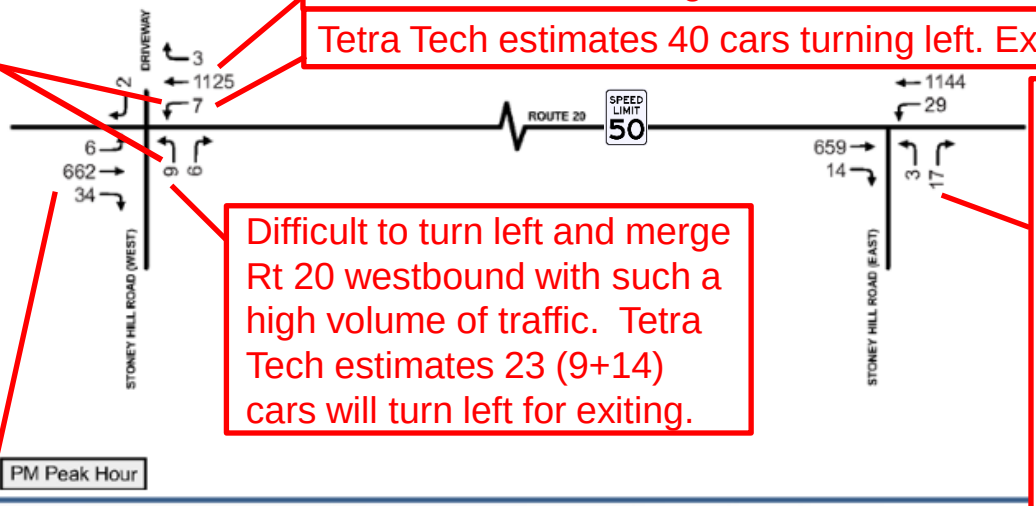
Existing Traffic Volumes - *Stoney Hill West End PM Peak*

- **Existing traffic volumes are very challenging for PM Peak hour left turns**
- **Stoney Hill West End left turns are avoided during peak hours. Lowering the estimated use**
- **Average is one car every 3.2 seconds traveling west & 5 seconds east. While estimates predict one car a minute will wait on Rt 20 to turn left into SH**
- **Tetra Tech estimates 23 cars will try to turn left exiting SH into a single 50mph westbound lane and avoiding all other traffic.**
- **This intersection will be unsafe during PM Peak times**

Left turn Avoidance: These 2 left turns are lower than normal because drivers avoid turning left during peak times and use SH East for both enter & exiting. The extra Rt 20 left lane will have more neighbors using this entrance

1125 vehicles = average is **3.2 seconds** a vehicle travels west

Tetra Tech estimates 40 cars turning left. Extra lane will make it more



Difficult to turn left and merge Rt 20 westbound with such a high volume of traffic. Tetra Tech estimates 23 (9+14) cars will turn left for exiting.

Extra traffic from SH West End Avoidance: Many drivers avoid taking a left out of SH West during Peak times because of the traffic congestion & safety concerns. Instead choosing SH East to exit and take right turn.

Tetra Tech estimates: 662 + 53 vehicles = average is **5 seconds** a vehicle travels east. 34 + 17 cars = about **1 car a minute** will turn right into SH

TETRA TECH

Why Not A Traffic Signal?

For eight hours over a course of a day, the hourly traffic volume on the major street (both directions), and for the same hour, the traffic volume on the minor street must exceed the criteria listed in the MUTCD.

Table 4C-1. Warrant 1 Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42

Rt 20 **525** veh/hr requirement

Stoney Hill West **53** veh/hr requirement

Amount over/under 53 vehicle requirement

14 hours of 2x to 4x over 525 req.

Reason for SH West Driver avoidance

Hour	Rte. 20 Total	Stoney Hill Rd. NB	
0:00	161	1	
1:00	103	0	
2:00	93	1	
3:00	100	0	
4:00	150	3	
5:00	528	16	
6:00	1301	44	-9
7:00	1859	108	+55
8:00	1752	91	+38
9:00	1333	44	-9
10:00	1245	29	
11:00	1253	22	
12:00	1342	29	
1 pm	1319	39	-14
2 pm	1472	25	
3 pm	1698	29	
4 pm	1815	48	-5
5 pm	1955	42	-11
6 pm	1502	41	-12
7 pm	1061	31	
8 pm	807	16	
9 pm	618	6	
10 pm	401	1	
11 pm	291	1	

Cars avoid SH West left turn during these hours

- **Tetra Tech stated – *Occasionally, MassDOT may allow installation of a traffic signal if traffic volumes in at least six hours meet the criteria, such as if safety or long delays are improved.***
- **Rt 20 traffic is 2 to 4x over requirement**
- **SH West End traffic data shows we are missing the 6 hr requirement for 4 hrs by 5 to 11 vehicles/hr. Or 8 hr req. by 5 to 14 vehicles/hr**

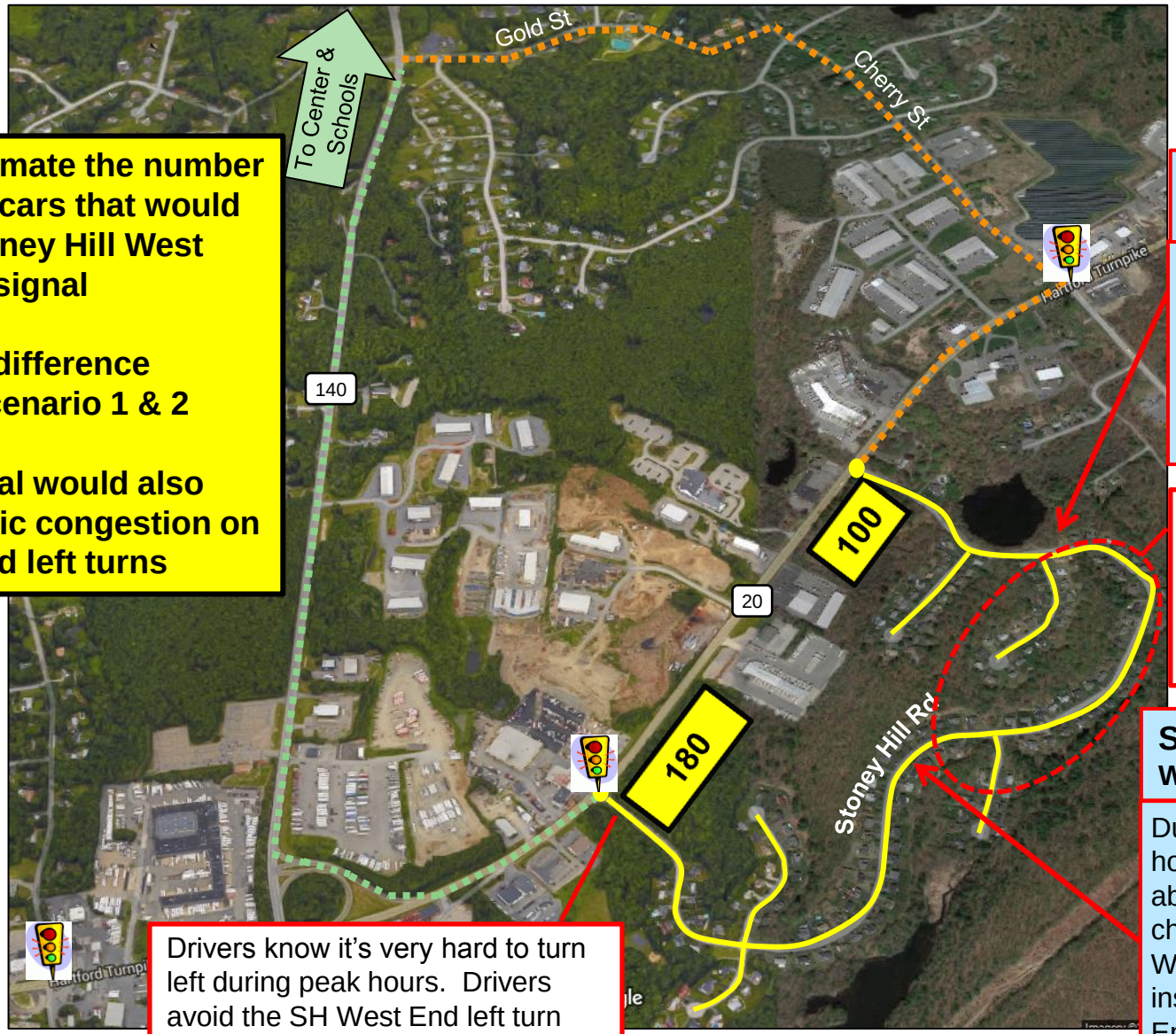
Stoney Hill West End traffic light scenarios

Why we may qualify for a traffic signal

Should estimate the number of addition cars that would use the Stoney Hill West End traffic signal

~60 house difference between Scenario 1 & 2

Traffic signal would also relieve traffic congestion on SH East End left turns



Scenario 1:
With a traffic light

During busy Rt 20 hours - houses from about this point may choose to use SH West traffic signal to turn left onto Rt 20.

These ~60 houses aren't accounted for in the traffic study if a Stoney Hill West End traffic light is installed

Scenario 2:
Without a traffic light

During busy Rt 20 hours - houses from about this point may choose to avoid SH West End left turn and instead use SH East End and turn right

Drivers know it's very hard to turn left during peak hours. Drivers avoid the SH West End left turn and instead use SH East End

Stoney Hill Road – West
Vehicle Delay and Queuing Study

We want to report the average delay for just left turns only. It's the left turns which are of most concern.

The right turns have a second lane to turn into anand right turns are very short delays. Averaging both right & left turns will skew the delay times

These delay times are an average for both a Left or Right turns. Our main concern is the Left turns

	AM	PM
Average Delay	28 sec.	10 sec.
Average Queue	1 veh.	1 veh.
Max. Queue	3 veh.	2 veh.

Stoney Hill Road Level of Service

Level of Service	Average Delay per Vehicle (Seconds)
A	≤10.0
B	0.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	>50.0

Expect LOS to be much worse when examining for only Left turn delay times

West Approach

- 7:30 am to 8:30 am: 28 seconds (LOS D)
- 5:00 pm to 6:00 pm: 10 seconds (LOS A)

East Approach

- 7:30 am to 8:30 am: 27 seconds (LOS D)
- 5:00 pm to 6:00 pm: 11 seconds (LOS B)

Stoney Hill West End

Example snow ridge pulling out onto Rt20

Morning of first snow - 12/29/15 at 10:10am

- Rt 20 is clear
- Stoney Hill Rd hasn't been plowed by the town yet (note it's after peak traffic)
- Snow makes it difficult to pull out with cars traveling 50mph on clear Rt 20

Stoney Hill West End

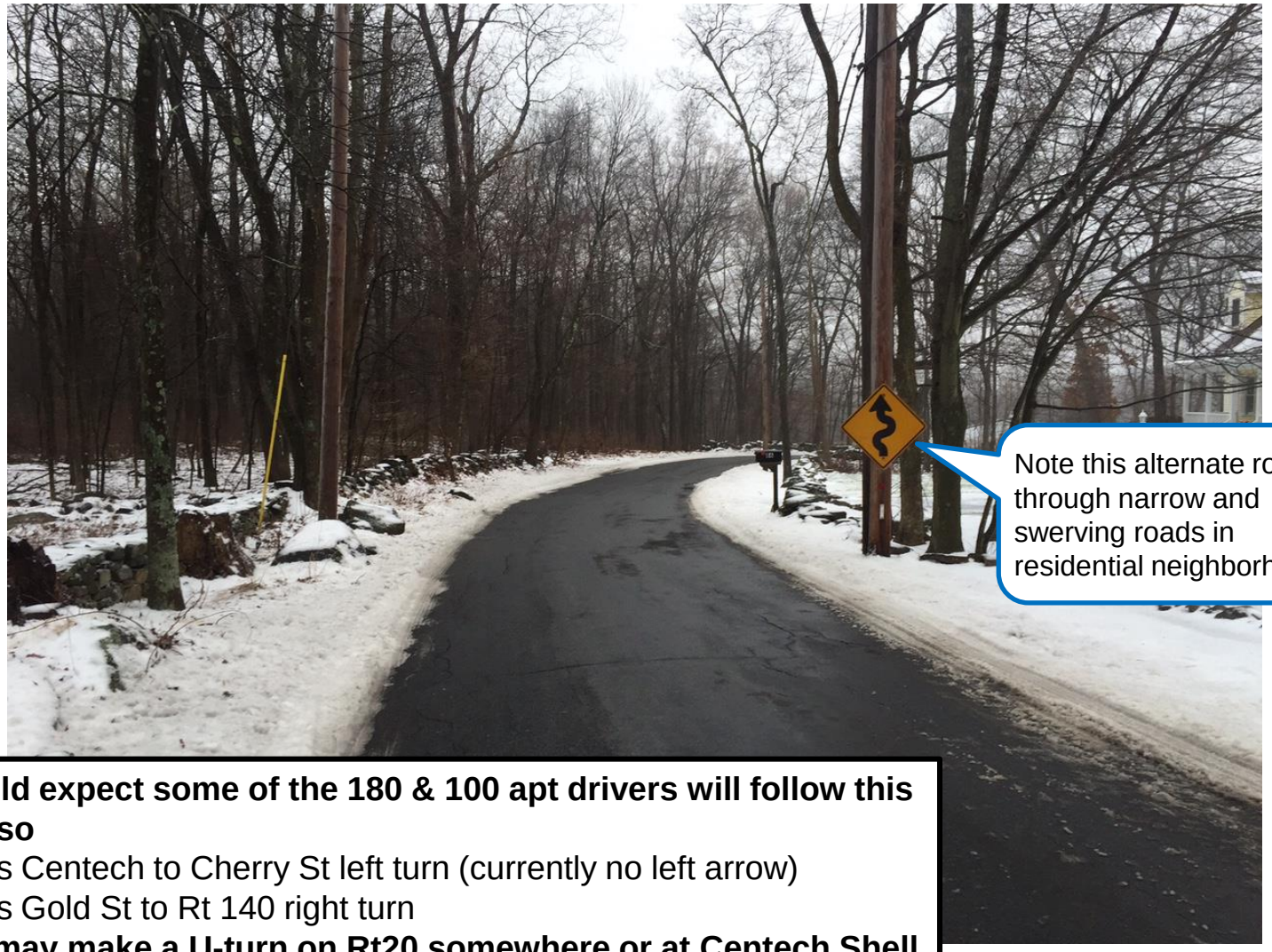
Example snow ridge pulling out onto Rt20

Morning after first snow - 12/30/15 at 7:21am

- Rt 20 is clear
- Stoney Hill Rd has been plowed but is icy
- Snow makes it difficult to pull out with cars traveling 50mph on clear Rt 20
- Sometimes Rt 20 isn't clear and has uneven snow traction when crossing Rt 20 lanes

Cherry St to Gold St to Rt 140

Often an alternate route for Stoney Hill drivers avoiding a left turn out of the neighborhood



Note this alternate route is through narrow and swerving roads in residential neighborhoods

We would expect some of the 180 & 100 apt drivers will follow this route also

- Impacts Centech to Cherry St left turn (currently no left arrow)
- Impacts Gold St to Rt 140 right turn

Others may make a U-turn on Rt20 somewhere or at Centech Shell

(taken 12/30/15)

Summary

- Tetra Tech data may actually support a traffic light
  - peak traffic times are & will be very unsafe
  - account for drivers who avoid SH West left turn at peak times
  - account for ~60 additional houses when traffic light installed
- SH West End LOS should be reevaluated for left turn only
  - LOS (or Safety) is much worse for left turns
- Winter weather, wider Rt20 & increased traffic will be difficult and unsafe exiting the neighborhood
- Without a traffic light this will be one of the most dangerous intersections in Shrewsbury

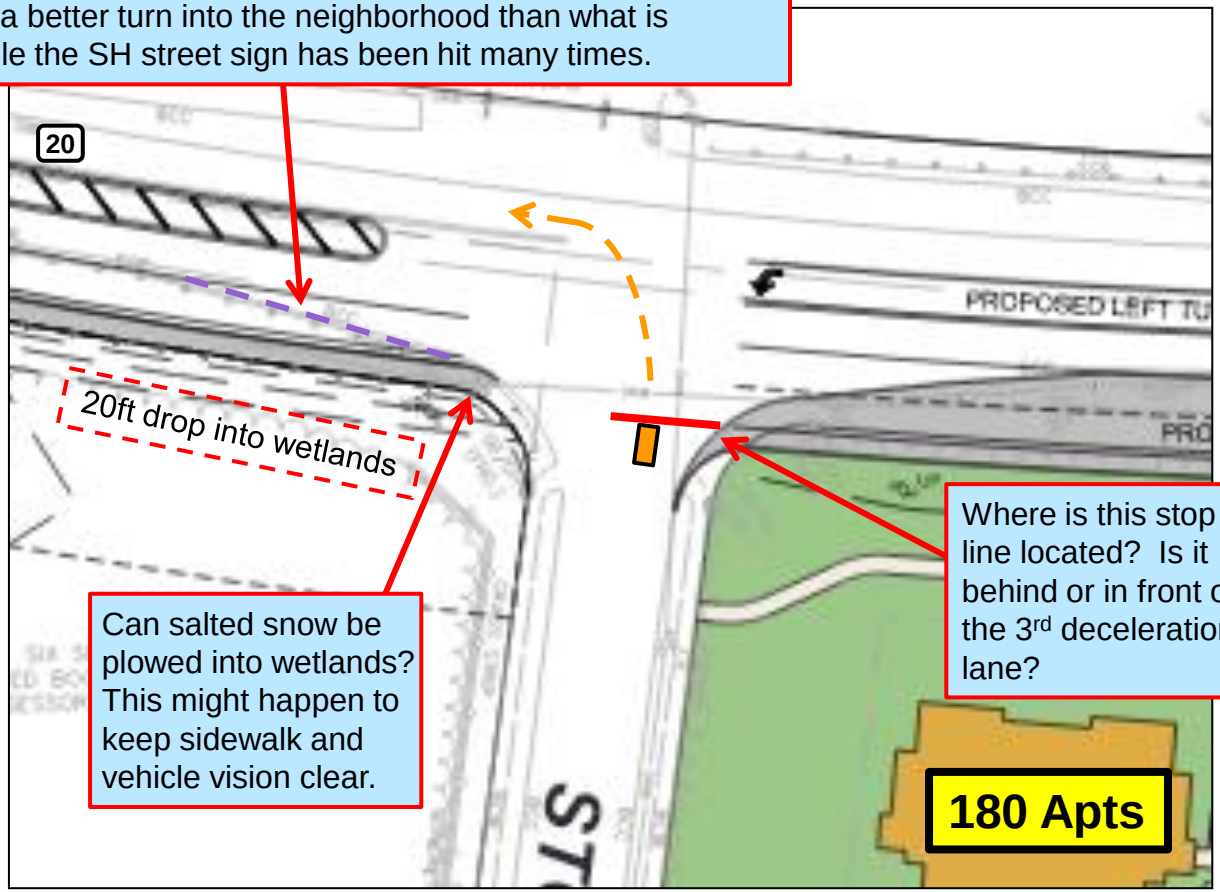
Appendix

Stoney Hill West End

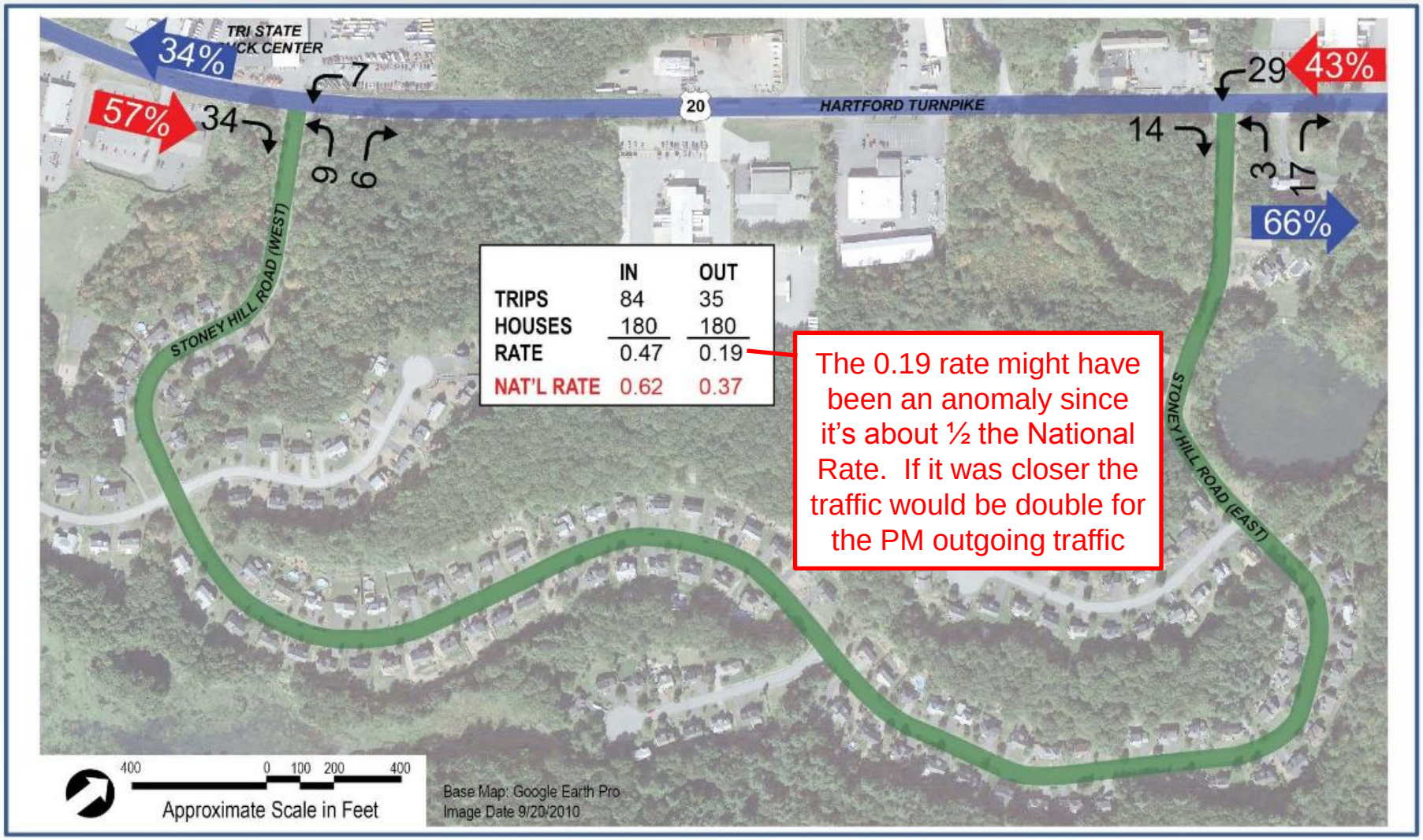
(based on 11/6/15 plans)

Imagine you're the orange car trying to turn left

Purple dashed line shows the existing deceleration turning corner into Stoney Hill Rd. Is there a reason that this isn't needed or required anymore? The new proposal shows a tight 90 degree turn off of Rt 20 and no breakdown lane. We would want a better turn into the neighborhood than what is proposed. For example the SH street sign has been hit many times.



Stoney Hill Road – PM Peak Hour



Stoney Hill West End

Example snow ridge pulling out onto Rt20

Morning after first snow - 11/30 at 7:23am
- This morning the snow is icy
- I was here 5 min and saw a 2 car queue
- Notice the sign has been run over and reinstalled

Stoney Hill Road – East
Vehicle Delay and Queuing Study

We want to report the average delay for just left turns only. It's the left turns which are of most concern.

The right turns are often a short delay. Averaging right turns will skew the delay times.

These delay times are an average for both a Left or Right turn. Our main concern is left turns

	AM	PM
Average Delay	27 sec.	11 sec.
Average Queue	2 veh.	1 veh.
Max. Queue	4 veh.	1 veh.